

# Controlling Greenhouse Gases From Highway Vehicles

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# Introduction

- U.S. emits 21% of world's GHGs.
- 85.1% of U.S. GHGs are CO<sub>2</sub>.
- Transportation emits 33.2% of CO<sub>2</sub> from fossil fuel combustion.
- 97.9% of CO<sub>2</sub> from petroleum combustion.
- 59.9% of the emissions were from gasoline used by motor vehicles.



- $\text{CO}_2$  is the end product of chemically perfect combustion.
- No known cost effective way to capture it from mobile source emissions.
- Options are: drive less and/or use more fuel efficient vehicles.

# VMT

- Vehicle miles traveled is the measure of highway transportation consumption.
- Increases by about 1.2% a year.
- 55% of increase due to population growth; 45% due to consumer choice.
- Nullifies improvements in vehicle fuel efficiency.

# Petroleum

- 60.6% of U.S. oil consumption is for highway vehicles; 2/3s of this for light vehicles.
- Petroleum imports in 2009 were 51.9% of consumption.
- Imported oil cost nearly \$500 billion in 2008 and about \$300 billion in 2009.
- DOD spends about \$50 billion a year to protect oil supply.
- \$42 billion in FY2010 for FHTSA.
- Oil prices are expected to rise.

# Fuel Efficiency

- 40% increase in fuel efficiency in light-duty vehicles at no net cost is possible.
- Perhaps more but with tradeoffs.

# CAFÉ

- Energy and Policy Conservation Act of 1975 provided for Corporate Average Fuel Economy Standards.
- Four standards: domestic passenger vehicles, imported passenger vehicles, domestic light-duty trucks, and imported light-duty trucks.

# CAFÉ Standards

- MY1990 - MY 2010 27.5 mpg for cars.
- MY 1996 - MY 2004 20.7 mpg for light-duty trucks.
- Light-duty trucks in 1970 17.4% of fleet.
- Light-duty trucks in 2008 44.57% of fleet.



# Massachusetts v. EPA

- 2007 Supreme Court rules GHGs are pollutants under CAA § 302(g).
- EPA had to make an endangerment finding.
- CAA § 201(a)(2) requires industry be given the necessary time to comply and costs must be considered.

# Energy Independence and Security Act of 2007

- Combined fleet average of 35 mpg by MY2020.
- 2009 NHTSA directed to issue new standards.
- MY2011 passenger cars -- 30.2 mpg
- MY2011 light-duty trucks -- 24.1 mpg

# EPA and NHTSA Joint CO<sub>2</sub> Regulations

- December 15, 2009, EPA makes endangerment finding.
- Many lawsuits follow.
- May 7, 2010 EPA & NHTSA promulgate final joint rule for MY2012 -- MY2016.

# MY2012 -- MY2016

- MY2012 cars -- 33.3 mpg
- MY2012 light-trucks -- 25.4 mpg
- MY2012 combined -- 29.7 mpg
  
- MY2016 passenger cars -- 37.8 mpg
- MY2016 light-duty trucks -- 28.8 mpg
- MY2016 combined -- 34.1 mpg

# MY2017 -- MY2025

- EPA & NHTSA notice of intent May 21, 2010.
- Proposed rule September 30, 2011.
- Final rule July 31, 2012.

# Heavy-Duty Trucks

- EPA & NHTSA proposed rule November 30, 2010.
- First ever effort to reduce GHG emissions from medium- and heavy-duty vehicles.
- Applies to 1) combination tractors, 2) heavy-duty pickups & vans, & 3) vocational vehicles (e.g. fire engines).

# EPA/NHTSA

- EPA seeks a 17% reduction for diesels & 12% reduction in gasoline vehicles by 2018.
- EPA also limits A/C leakage to 1.5% a year.
- NHTSA seeks a 15% reduction from diesels & a 10% reduction from gasoline vehicles by 2018.
- NHTSA regulates chassis and engines for vocational vehicles.

# Heavy-Duty Vehicles

- 8,501 pounds GVWR or more.
- Standards are work-based and are in grams per mile for pickups and vans; they are in grams per ton mile or gallons per 1,000 ton mile for vocational vehicles and combination tractors.



# California Mobile Source GHG

- CAA § 209 states with pre-1966 emission controls.
- 1977 modifications to § 209.
- EPA is limited in its ability to deny a waiver--not consistent with § 202(a) or not needed to meet compelling conditions.

# CAA § 177

- States with N/A areas may adopt California standards if identical.
- 2 year lead time required.
- 9 N.E.states plus Arizona, Florida, N.M., Oregon & Wash. D.C. adopted CA standards.

# CA CO<sub>2</sub> Control

- 2002 A.B. 1493--CO<sub>2</sub> reductions of 22% from 2002 by 2009.
- Dec. 1, 2005, CA applies to EPA for a waiver.
- March 2008, waiver denied based on lack of “compelling and extraordinary conditions.”
- June 30, 2009, Obama Administration grants CA a waiver.
- Sept. 24, 2009, CARB adopts GHG regulations for new MY2012-MY2016 passenger vehicles.

# Federal Regulations

- May 7, 2010, new CAFÉ standards for MY2012 through MY2016 that are more stringent than CA.
- Automakers agree to drop lawsuits.

# Cap-and-Trade

- CA adopts cap-and-trade in 2006 (AB32).
- 2015 program expands to cover transportation fuel.
- Opponents bring Proposition 23 to voters.
- It loses Nov. 2, 2010, but Proposition 26 passes--2/3s vote for fees.

# MY2017-MY2025

- CA to promulgate standards in spring of 2011.
- EPA to propose standards in fall of 2011 and finalize them in July 2012.

# Conclusion

- Vehicles obtaining >35 mpg on sale now, but are not purchased in large enough numbers to significantly reduce CO<sub>2</sub> emissions.
- Population growth and VMT growth drives emissions growth.
- Fuel taxes of about 48 cents per gallon should be increased.

# Conclusion continued

- Hybrid vehicles
  - Electric vehicles
  - Natural gas-fueled vehicles
  - Alcohol-based fuel
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- Aim should be to reduce petroleum imports.